Water Quality
Supplement 5.7

Station #4: Electrical Conductivity

Work Sheet

Background

Electrical conductivity is a measure of the ability of a water sample to carry an electrical current. Pure water is a poor conductor of electricity. It is the impurities in water, such as dissolved salts, that enable water to conduct electricity. Therefore, conductivity is often used to estimate the amount of dissolved solids in the water since it is much easier than evaporating all the water molecules from a sample and weighing the solids that remain.

Conductance is measured in a unit called the microSiemens/cm. Sensitive plants can be damaged if they are watered with water that has electrical conductivity levels above about 2200 to 2600 microSiemens. For household use, water with conductivity below 1100 microSiemens is preferred. Manufacturing, especially of electronics, requires pure water.

Procedure

- Following the steps in the *Electrical Conductivity Procedure,* each member of the group takes a turn measuring the conductivity of the same tap water sample. Compare your readings. Are they within 40 μSiemen/cm of each other? Why? Why not? If not, repeat this exercise with another water sample until you are obtaining readings within 40 μSiemen/cm of each other.
- Without calibrating the electrical conductivity pen, but following the steps of the procedure, take turns measuring the conductivity of distilled water, tap water and distilled water to which you have added a pinch of salt. Record those numbers as per example below.
- Calibrate the pen and repeat the measurements carefully following the procedure to avoid contaminating samples. Record your readings.
- Compare the data obtained using the uncalibrated pen and the calibrated pen. Is there a difference? Discuss possible reasons for the difference. Is one pen always higher or lower than the other? By the same amount?
- Measure the conductivity of familiar liquids such as vinegar, drinking water, milk, juice, *Coke*, etc.
- List the samples you checked and record the results.
- What is the range of conductivity readings? Create a conductivity scale and plot the value obtained for each sample.

Sample Tested	Uncalibrated Conductivity Pen	Calibrated Conductivity Pen
Distilled water		
Tap water		
Salty water		